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Fragmented governance and spatial equity in metropolitan areas: the role of intergovernmental cooperation and revenue-sharing

by

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Abstract:

This article focuses on policies seeking to address social inequalities in metropolitan areas, where the allocation of resources to places with needs often clashes with the politics of redistribution in fragmented local government systems. Scholarship on metropolitan governance has yet to overcome the opposition between proponents of consolidation and defenders of polycentrism. The crucial open question is whether and how intergovernmental cooperation and revenue-sharing can redress spatial equity in institutionally fragmented metropolitan areas. This article addresses this question by exploring the determinants of social expenditures in the 630 municipalities of seven major metropolitan areas in Switzerland - where revenue-sharing systems are common. The analysis shows that intergovernmental grants make a significant but limited contribution to reducing the mismatch between needs and resources in fragmented and decentralised metropolitan areas, depending on the redistributive efforts made by higher state levels.

Keywords:

metropolitan governance, SSGI (social stratification and government inequality) thesis, spatial equity, social policy, fiscal federalism

Introduction

In the last four decades, global inequalities have increased (Milanovic 2016), and within many developed societies the distribution of wealth is as unequal again as it was at the end of the 19th century (Piketty 2013). Rising levels of social inequality also bring new urgency to policies and institutions that seek to address them. They have revived discussions on the redistributive role of the State, both in politics and academia. The debate prominently focuses on the development, adaptation and/or threats to the Welfare State, conceived as the set of social policies that organise solidarity and seek to promote equity among individuals belonging to nation-wide political communities. This article emphasises an aspect that is rarely covered in this debate, namely the spatial dimension of social inequalities and, related to this, the workings of institutions and policies seeking to address them. Theories of social justice traditionally focus on relationships between individuals rather than between places (for a discussion, see Fainstein 2010). But places can cumulate advantages or disadvantages that strongly affect the lives, choices and opportunities of people who live there. In the United States, for instance, the chances of intergenerational social mobility vary substantially across residential areas, and are strongly associated with place-based characteristics, such as residential segregation, income inequality, school quality, social capital and family structure (Chetty et al. 2015: 1620). As spatial disparities shape the structure of social inequality, institutions and policies that mitigate such disparities are thus important to an equitable distribution of wealth in society.

In this article, we assume that locally provided public services play an important role in furthering spatial equity. Note that equity is distinct from equality. While equality means that individuals or groups of individuals all have the same amount of resources, the notion of

equity entails that differences in resource levels may be normatively acceptable, as long as they are rooted in differences in need (Boyne et al. 2001). The allocation of sufficient resources to places with needs is thus at the core of spatial equity. But this goal often clashes with the politics of redistribution in fragmented local government systems, as localities seek to avoid costly redistributive policies (Buchanan 1971, Peterson 1981). In the literature, two contrasting views on this dilemma can be found. On the one hand, an important strand of research shows that, in institutionally fragmented settings, policies that seek to further spatial equity often stand in conflict with local choice. Proponents of this view therefore tend to advocate governmental consolidation and centralisation. On the other hand, theories of fiscal federalism have suggested reconciling these contradictions via cooperation and revenue-sharing. Intergovernmental grants, it is argued, allow redistributing resources to jurisdictions with greater fiscal needs, all the while maintaining the benefits of decentralisation and local autonomy.

The goal of this article is to discuss these two contrasting arguments - which will be presented in more detail in the next section. More precisely, we will do so on the basis of a study examining the determinants of social expenditures in the 630 municipalities pertaining to the seven major metropolitan areas in Switzerland. The Swiss case is significant for two reasons. On the one hand, governmental fragmentation of Swiss metropolitan areas is very high in international comparison (Hoffmann-Martinot and Sellers 2005, Kübler 2007). On the other hand, Swiss federalism traditionally places strong emphasis on solidarity between subnational entities, and its institutions and practice are generally cooperative and collaborative, rather than competitive. Metropolitan areas in Switzerland thus provide a pertinent empirical context to examine questions of spatial equity in the light of the conflict between local choice and inter-local redistribution. If we can expect to find real world examples in which this conflict has been overcome, metropolitan areas in Switzerland would be likely candidates. However,

as we will show, this expectation is not supported by empirical evidence. While revenue-sharing and intergovernmental cooperation does contribute to mitigating spatial disparities, the territorial mismatch between resources and needs in the fragmented local government system remains significant and is thus a source of spatial inequity. What is more, we find a lack of local policy responsiveness that also questions the decentralisation theorem cherished by fiscal federalism.

Equity and metropolitan governance: theoretical considerations

An increasing majority of the world's citizen lives in metropolitan areas: functionally integrated city-regions that stretch over a multitude of governmental units (Hoffmann-Martinot and Sellers 2005). The challenges to policy-making that result from this process of metropolitanisation have sparked a long-running debate about the best way to govern metropolitan areas (for a recent overview, see Savitch and Vogel 2009). Traditionally, this debate pitted advocates of institutional consolidation and centralised regional systems against proponents of local autonomy and polycentric governance. For a long time, it has fuelled disputes over municipal amalgamation, city-county consolidation in the US, and establishing new scales of government at the metropolitan level. In the 1990s, however, a third perspective emerged which emphasised the role formal and informal networks of intergovernmental cooperation play in solving metropolitan problems (Wallis 1994). This *new regionalism* takes a more relaxed view about the design of territorial institutions in metropolitan areas, and argues that the routes to regional governance capacity in metropolitan areas can be diverse. As institutional consolidation often proves impracticable, intergovernmental cooperation between autonomous localities, or policy networks involving non-state actors, are considered functional equivalents as long as they successfully associate the actors that are relevant to policy-making.

Spatial equity and governmental fragmentation: the SSGI thesis

Matters of equity are a core concern in this long-running debate. The consolidationist position was elaborated as part of the SSGI (social stratification and government inequality) thesis (see Box 1). This was originally formulated by Hill (1974) and Neiman (1976) based on evidence showing that social inequality in US metropolitan areas was strongly associated with the degree of governmental fragmentation. The SSGI thesis posits that a fragmented governmental setting, due to residential sorting and social segregation, leads to a situation where poor municipalities lack the public resources necessary to address their residents' needs. In addition, the small size of jurisdictions in fragmented settings enables concentrations of wealthy residents to influence municipal policies so as to reduce redistribution and keep taxes low. The result is a systematic mismatch between resources and needs, whereby income inequalities are perpetuated and even reinforced. A drastic illustration is Massey and Denton's (1993) 'American Apartheid' argument, according to which the governmental fragmentation of the US metropolis has perpetuated and reinforced racial segregation and poverty among African-Americans. In a similar vein, but more subtly, Downs (1994) points to the mechanisms of exclusionary zoning by which small and wealthy jurisdictions use their autonomy to restrict housing choices for disadvantaged groups, thus ensuring that the rich can remain among themselves. Governmental fragmentation of the metropolis, it seems, enables the rich to sort into wealthy municipalities and 'shield themselves from observing poverty by the absence of a political forum in which it might be addressed' (Lowery 2000: 65). This argument has often informed calls for institutional consolidation through municipal mergers (Rusk 2003) or the creation of strong metropolitan governments (Orfield 2002).

Box 1: Eight propositions derived from the SSGI thesis (Ostrom 1983: 94-95)

- P1: Families with similar resources, beliefs and habits regarding living patterns will tend to seek residences near one another.
- P2: Residents tend to use municipal powers, such as zoning and other land use controls, to enhance the relative fiscal position of the jurisdiction in which they live and the social homogeneity of the neighbourhood in which they live.
- P3: Suburban municipalities are consequently divided into many relatively homogenous communities of the poor, the middle class, and the wealthy.
- P4: The larger the number of municipal governments in the metropolitan community, the greater the inequality in the distribution of fiscal and other resources among them.
- P5: The higher the social status of a jurisdiction, the greater the level of resources available to support public services..
- P6: The higher the level of public resources allocated to a service, the higher the level of services received by a population living in a jurisdiction.
- P7: Central cities tend to allocate services in favour of the poor.
Thus
- P8: Municipal government becomes an institutional arrangement for promoting and protecting the unequal distribution of scarce resources.

Public choice scholars, who tend to favour fragmented and polycentric metropolitan governance structures, take a different view. Drawing on Elinor Ostrom's (1983) compelling critique of the SSGI thesis (which she aptly summarized as a set of eight propositions, see Box 1), public choice scholars have viewed governmental consolidation as an inadequate answer to redistributive issues in metropolitan areas. Local autonomy and fragmented government, they argue, improves service responsiveness and is therefore not only beneficial to the rich but also to the poor. In addition, they point out that the problem of fiscal disparities between local jurisdictions can be addressed by transferring fiscal resources to poor localities through intergovernmental cooperation or revenue-sharing sharing: 'The SSGI assertion that fragmentation is the cause of inequity in service delivery ignores the role of overlapping governmental units in redistributing resources at county, state, and federal levels to municipalities with a poor resource base. [...] To understand distribution patterns in metropolitan areas, one must examine the compound system and not just one horizontal layer' (Ostrom 1983: 93). The key point is that polycentric systems of governance create institutional opportunities that will eventually foster the emergence of solutions to policy

problems by ‘never-ending processes of experimentation catalysed by public entrepreneurs operating at all scales of organization, from local to national’ (Wright et al. 2011: 17).

Polycentricity entails an element of self-governance that, in the end, may lead to the adoption of policies suitable to regulate self-interest or solve distributive issues. Whether or not polycentric institutional arrangements reinforce or soothe spatial inequities, therefore, is essentially an empirical question. Examining the role of intergovernmental agreements in fragmented metropolitan settings, but also the role higher state levels play, is central to answering this question.

Fiscal federalism and the intergovernmental dimension of spatial equity

The intergovernmental sphere has thus moved to the core of the debate on redistributive issues in metropolitan areas. This nicely relates to the new regionalist turn in the debate on metropolitan governance, entailing a new emphasis on voluntary cooperation and partnerships across a range of different governmental (and non-governmental) entities within urban regions, instead of jurisdictional consolidation. However, empirical research on the new regionalism has mainly revolved around the economy and efficiency of public services as assets for global competitiveness, rather than around issues of equity and redistribution (Swanstrom 2001). Much European and American scholarship on the new regionalism indeed portends the view that the connection of metropolitan areas into the global economy is beneficial to everyone. One of the core questions left unresolved is the role of intergovernmental cooperation in addressing redistributive issues in urban regions (Jimenez 2014: 255).

The theory of fiscal federalism (see Oates 2011) provides interesting conceptual insights on this question. Fiscal federalists generally agree that policies of income redistribution should be centralised, as the mobility of economic units can seriously undermine attempts by local governments to engage in redistributive policies. As Oates puts it, ‘an aggressive local

program for the support of low-income households, for example, is likely to induce an influx of the poor and encourage an exodus of those with higher income who must bear the tax burden' (Oates 1999: 1127). Thus far, fiscal federalism would be in line with the SSGI thesis and the consolidationist perspective on spatial equity.

However, fiscal federalists have found that, notwithstanding fiscal incentives against redistribution at the local level, local governments often play a significant role in social policy making (Craw 2010, Gillette 2011). One reason for this is that local governments are far from fiscally independent: they relate to other governments both horizontally and vertically. Fiscal federalism conceives these relations in terms of intergovernmental grants, i.e. transfer payments through which funds can be allocated among different jurisdictions and which, for governments at all levels, constitute an important additional source of revenue beyond tax and debt. Intergovernmental revenues resulting from cooperation or revenue-sharing between localities, as well as between localities and higher level governments thus 'may loosen the constraints generated by interjurisdictional competition' (Craw 2016: 70) and thereby address the mismatch between resources and needs across different metropolitan places even in fragmented governmental settings.

But why should governmental fragmentation with strong intergovernmentalism be preferred over centralisation and institutional consolidation? The answer given by fiscal federalists in more recent work is accountability. In democratic processes, the weight of each individual citizen is inversely proportionate to the number of citizens living in a given jurisdiction. In smaller jurisdictions, elected decision-makers can be expected to be more responsive to citizens, and policy outcomes will match preferences better. 'Centralisation allows a greater coordination of policies (i.e. the internalization of interjurisdictional externalities), but decentralised decision-making promotes accountability,' writes Wallace Oates, explaining that fiscal federalists prefer decentralisation 'even if there are homogenous tastes across

localities, inasmuch as it enhances local control' (Oates 2005: 358). This argument is at the core of the so-called 'decentralisation theorem' (Oates 2011: 54-63) stating that, at equal efficiency for decentralised or centralised production of public goods, decentralisation is preferable because local autonomy ensures better accountability, meaning a sensitivity of outcomes to preferences. Intergovernmental grants can thus appear as a tool to reduce spatial inequities while maintaining the benefits of local autonomy.

Consolidationists remain sceptic, however, and show little faith in the ability of intergovernmental grants to address the undersupply of services to the poor in fragmented settings. Lowery, for instance, admits that it is theoretically plausible to assume a role for higher level governments or voluntary inter-municipal agreements. State governments could indeed decide and enforce redistributive policies, or municipalities could indeed agree on a plan to share their tax base or revenues. But he argues this is unlikely to happen: 'As a realistic prescription of a practical solution to the problems raised by the SSGI thesis, it leaves much to be desired. [...] [R]edistribution by higher levels of government is an attractive solution to the SSGI problem. So too is the *Independence Day* notion that an invasion from outer space will erase ancient racial, ethnic, and class divisions as we discover shared interests in a common struggle to kill aliens. It remains unclear which will occur first' (Lowery 1999: 16). The pessimism of consolidationists rests on the assumption that collective action among local governments, for example through voluntary agreements, must be Pareto-optimal to occur. This makes redistribution between rich and poor localities very unlikely: 'Any redress on the part of the poor must overcome the significant transaction costs associated with securing unanimous support from a non-representative metropolitan institution such as a council of government or must seek a venue outside of the metropolitan area at the state or national level' (Lowery 2000: 65-66).

Spatial equity and metropolitan governance: theoretical expectations

The insights from fiscal federalism thus help to clarify the main theoretical positions in the debate. On the one hand, consolidationist proponents of the SSGI thesis expect fragmented metropolitan settings to go along with a systematic mismatch between fiscal resources and social needs across metropolitan localities. Due to the obstacles in addressing redistributive issues in both inter-local cooperation or through action at a higher state level, they do not expect intergovernmental grants to substantially compensate for this fiscal mismatch. On the other hand, drawing on the insights of fiscal federalism, public choice critics of the SSGI thesis as well as new regionalists would expect that the dynamics of polycentrism found in fragmented metropolitan settings fosters the establishment of intergovernmental grants that reduce fiscal disparities between rich and poor localities, ultimately enabling more responsiveness to local needs and preferences.

An empirical assessment of these two positions entails examining the effects of governance arrangements on spatial equity in metropolitan areas, with a focus on the relationship between resources and needs in various localities. Equity does not mean all localities should have the same level of resources. It merely means that those with needs should get what they deserve: ‘The ratio of spending to needs should be equal across local authority areas, which also implies that there should be a close positive relationship between needs and spending’ (Boyne et al. 2001: 24). In the analysis that follows, we examine the determinants of social expenditures - the spending for policies that address redistributive needs - in municipalities located in fragmented metropolitan institutional settings. On the basis of the theoretical discussion, we can formulate a number of contrasting hypotheses for this analysis:

First, consolidationists and polycentrists diverge over the importance of social needs for redistribution. Proponents of the SSGI thesis argue that because poor communities lack fiscal resources, they are unable to engage in redistribution. Municipalities with extensive social

needs are hence not likely to engage in high social expenditures because they simply cannot afford to do so. The hypothesis here is that social expenditures in metropolitan municipalities are unrelated - or even negatively related – to existing social needs. By contrast, polycentrists argue that local authorities are sensitive to local needs and will therefore be more likely to engage in redistributive policies when social needs are extensive. Given the equalising effect of intergovernmental grants, this will also be possible in communities with less own-source revenues.

Second, consolidationists and polycentrists also diverge about the role of own-source revenues in determining social expenditures in metropolitan municipalities. Proponents of the SSGI thesis argue that the mismatch between resources and needs in fragmented metropolitan settings results from a logic of ‘to him that hath shall be given more’. They expect rich localities to spend more for redistribution because they have the capacity to do so. The hypothesis flowing from this is that social expenditures in metropolitan municipalities are mainly determined by fiscal resources, particularly own-source revenues. Polycentric detractors of the SSGI thesis would refute this hypothesis as too simplistic, and emphasise the role that intergovernmental grants play in redistributing resources. They thus expect intergovernmental grants to play a crucial role in determining social expenditures in metropolitan municipalities.

Finally, the debate on the SSGI thesis also points to local preferences as a third potentially influential determinant for spending patterns in municipalities. The importance of this variable has been underscored mainly by (fiscal federalist) scholars writing in defence of polycentric governance. Indeed, consolidationists tend to celebrate centralised decision-making over preference-matching in autonomous localities. The question of how policy choices in the latter context do or do not match citizens’ preferences is of secondary importance to them. But to polycentrists, the responsiveness of local policy choices to citizen

preferences is crucial. It is, in fact, their core argument for preferring fragmented institutions and decentralised decision-making over consolidation and centralisation. Thus, a further hypothesis flowing from the polycentrist position expects that social expenditures in metropolitan municipalities are closely related to political preferences in favour of redistributive policies.

The Swiss context

Theoretical relevance

The bulk of existing research on the redistributive effects of institutional arrangements in metropolitan areas has been conducted in the US (for a recent overview, see Craw 2016). This geographical focus has an important limitation, as it is unclear to what extent findings and conclusions can be generalised. This limitation is particularly evident with respect to the effect of intergovernmental grants, i.e. the arrangements of intergovernmental cooperation and revenue-sharing that operate in the multi-level governance compound of metropolitan areas.

True, intergovernmental cooperation between localities is widespread in US metropolitan areas. But empirical evidence shows that the underlying rationale is - as expected by proponents of the SSGI thesis - mainly Pareto efficiency and not redistribution (Andrew 2009, Carr et al. 2009, Feiock 2009). A recent overview of governance and finance of metropolitan areas in the US concluded that intergovernmental cooperation in US metropolitan areas was mostly limited to providing regional infrastructure, services or public goods but did not involve redistribution (except to some extent for school districts) (Vogel and Imbroscio 2013). Similarly, while intergovernmental transfers do play a role within US states, most of these payments are part of state policy programs. When local governments in US metropolitan areas engage in redistribution by spending a significant share of their budget on social policies (mainly in health and welfare), they are heavily dependent on own-source revenues - taxes, property taxes, user fees, and the like. Intergovernmental revenue-sharing is extremely

limited: the Twin Cities (Minnesota) are reportedly the only major US metropolitan area to feature a metropolitan-wide tax-base sharing system (Orfield and Luce 2010: 40). For the debate on the distributive consequences of metropolitan governance arrangements, it is therefore high time to study cases outside of the US - which is what we do in this article.

Focusing on the major metropolitan areas in Switzerland, we explore the relationship between patterns of municipal needs and fiscal resources on the one hand, and the level of social expenditures in metropolitan municipalities on the other hand, while accounting for the effects of intergovernmental grants in re-allocating fiscal revenues. The seven Swiss metropolitan areas under scrutiny provide a setting with important similarities but also differences to the US context. On the one hand, Swiss metropolitan areas are similar to their US counterparts in that they are characterized by high institutional fragmentation (Hoffmann-Martinot and Sellers 2005). Local government systems in both countries are also similar in terms of local government capacities and supervision by higher state levels (Sellers and Lidström 2007). On the other hand, Swiss and US metropolitan areas differ inasmuch as Swiss federalism is oriented more towards solidarity and cooperation, and less to the kind of competition found in US federalism. This echoes the distinction between the ‘integrated’ and ‘dualist’ types of federations to which the two countries respectively belong (Anderson 2010: 12).

Intergovernmental cooperation and revenue-sharing are crucial features of Swiss federalism, and their importance has increased in the last decade (Koch and Kübler 2011). Indeed, such cooperation and revenue-sharing is operational since the mid-twentieth century in all seven metropolitan areas under scrutiny here (for more details, see the supplementary material in the online appendix).

Metropolitan areas in Switzerland: extension and institutional structure

Switzerland has been profoundly urbanized over the last century (Bassand 2005), leading to the functional integration of large urbanized territories, but at the same time to social

segregation within them. Among the forty-eight functional metropolitan areas ¹ delimited in the latest available official definition from the 2012 population census (Bundesamt für Statistik 2014), seven have a population close to or more than 200,000 inhabitants. These are the metropolitan areas of Zurich, Basel, Geneva, Bern, Lausanne, Lucerne, and Lugano (see Table 1), which are the basis for the subsequent analysis. Taken together, they include 630 municipalities and contain roughly 3.4 million inhabitants, corresponding to roughly fifty-five per cent of the country's urban population.

In contrast to most countries of Northern Europe, the local government structure in Switzerland has not been subject to comprehensive territorial reforms in the 20th century. Municipal amalgamations have taken place incrementally and sporadically. As a consequence, municipalities are small and suburbanization is high. In a typical Swiss metropolitan area, roughly two-thirds of the overall population lives in suburbs outside the core city. This is reflected in the number of municipalities per 10,000 inhabitants, a proxy for governmental fragmentation (see Table 1).

Table 1: Demographic and institutional structure of seven major Swiss metropolitan areas (2012)

Metropolitan area	Overall population	Number of municipalities	Municipalities per 10,000 inh.	Cantons included
Zurich	1,246,210	152	1.2	ZH, AG, SZ, SH
Basel*	524,764	107	2.0	BS, BL, SO, AG
Geneva*	546,222	88	1.6	GE, VD
Bern	381,465	77	2.0	BE, FR
Lausanne	366,996	132	3.6	VD, FR
Lucerne	215,251	19	0.9	LU, NW
Lugano*	143,757	55	3.8	TI
Overall	3,424,665	630	2.15	14

*excluding foreign municipalities in cross-border metropolitan areas

Source: Swiss Statistical Office, population census data

Another feature of governmental fragmentation in Swiss metropolitan areas is that they often transcend boundaries of the cantons - as the federate states are called in Swiss federalism. Six

of the seven metropolitan areas examined here have municipalities located in more than one canton. Altogether, the metropolitan municipalities under scrutiny in this article are located in fourteen different cantons (see Table 1).²

Swiss fiscal federalism

Switzerland is a federalist state with three levels of government: the national (*Bund*), state (26 *Kantone* or cantons), and local (roughly 2400 *Gemeinden* or municipalities). Swiss federalism is ‘decentralised’ due to the strength of the cantons and the relative weakness of the national government, not only in terms of legal competencies but also in terms of fiscal resources and implementation power (Braun 2003). Constitutionally, Swiss municipalities have no independent power, as their autonomy is subject to cantonal legislation both in terms of legal competencies and fiscal resources. But in general, and compared to other federations, local autonomy is quite high in Switzerland and decentralisation and subnational autonomy have long been seen as crucial ingredients to national cohesion in a multi-cultural society.

Swiss federalism has been characterized as less competitive and more collaborative than its US counterpart (Linder 2010: 72). Nevertheless, competitive elements are present, resulting most notably from the principle of tax autonomy at all three levels of government, which has been enshrined since the foundation of the Swiss federation in 1848. The national, cantonal, and municipal governments each have the right to raise their own taxes on income and property. This tax autonomy has sparked fiscal competition at the subnational level, and it has become a characteristic feature of Swiss federalism. Fiscal competition between cantons has led to the emergence of a wide range of different cantonal tax regimes. Additionally, there is fiscal competition between municipalities within cantons, and municipal tax rates differ quite substantially. These features of decentralisation and subnational competition are reflected in public finance figures. In 2010, the share of the cantons in overall public expenditures was 42.3 per cent, considerably higher than that of the national government (33.6 per cent) or of

the municipalities (24.1 per cent). On the revenue side, the cantons also have the lion's share (42.2 per cent of overall public revenues), compared with the national government (34.5 per cent) or the municipalities (28.4 per cent) (Eidgenössische Finanzverwaltung 2012).

The collaborative element in Swiss federalism entails widespread intergovernmental cooperation and revenue-sharing - both vertically and horizontally. For 2010, a large proportion of cantonal revenues (29.7 per cent) stemmed from transfer payments from the national government, but also from other cantons (Eidgenössische Finanzverwaltung 2012). Intergovernmental grants were also an important feature of municipal finance: transfer payments account for more than a quarter of municipal expenditures (28.4 per cent), as well as for a substantial part of municipal revenues (12.6 per cent). Well in line with the theory of fiscal federalism, intergovernmental grants follow two distinct rationales.³ On the one hand, transfer payments are linked to numerous mechanisms for intergovernmental cooperation, co-decision, and co-financing, not only vertically across levels of government but also horizontally between jurisdictions at the same level (Klöti 2000, Bochsler 2010). On the other hand, transfer payments are at the core of revenue-sharing schemes set up in the mid- 20th century to counteract fiscal imbalances at the subnational level. Revenue-sharing schemes exist both at the national level (between cantons, as well as between cantons and the federation) as well as within cantons (between municipalities, as well as between municipalities and their canton). On the whole, intergovernmental cooperation and revenue-sharing are found to have kept tax competition in check, as yet there is no evidence for a ruinous race to the bottom (Gilardi et al. 2013).

Against this background, the academic interest in issues related to metropolitan governance in Swiss fiscal federalism began relatively late. In the beginning, the focus was on the exploitation of core cities by suburbs, resulting from spillover effects related to public infrastructure, or services which are of interest to the whole metropolitan area but essentially

catered for by the core cities (Frey 1988, Walter and Amacher 2013). Some studies focused on inter-municipal tax competition within Swiss metropolitan areas, and showed that spillover effects distort it and have contributed to income sorting and social segregation (Schaltegger et al. 2011). Other studies investigated the proliferation of inter-municipal cooperation arrangements set up to coordinate public policies on a larger scale, emphasizing that these mechanisms increase intergovernmental entanglement and coordination problems, and have accountability deficits that threaten policy responsiveness (Kübler and Schwab 2007, Plüss 2015). Remarkably, however, distributive and equity issues related to metropolitan governance thus far have not been a major focus of scholarly interest. Beyond its theoretical interest, this article therefore also aims to contribute to an improved understanding of the distributive consequences of metropolitan institutional arrangements in Switzerland.

Data and method

To assess the determinants of redistributive expenditures in metropolitan municipalities in Switzerland, we implement a cross-sectional research design focusing on the 630 municipalities that make up the seven major Swiss metropolitan areas (see Table 1). Due to limited accessibility of data on municipal public finance in Switzerland, efforts for data collection were considerable, and data could be collected only for one time point. Ideally, longitudinal data should be used for the study of fiscal outcomes. Nevertheless, given the exploratory nature of the present study - which is the first ever to collect, compare and analyse fine-grained financial data on such a large number of Swiss municipalities located in different cantons - we think that a cross-sectional design is appropriate.

Data sources and operationalization of variables

The analysis aims to single out the influence of fiscal resources, social needs, political preferences, and intergovernmental grants on redistributive expenditures in Swiss metropolitan municipalities. Data on these variables was collected for 2010 (or nearby years,

as available) from official sources (for details, see the methodological appendix in the supplementary material available online). Reliability and validity of data are therefore high. Data on geographic variables, socio-demographics and election results are based on definitions standardised at the national level and are therefore readily comparable across municipalities. Municipal public finance figures are not based on national standards, and comparability is an issue. Efforts to standardise public sector accounting across Switzerland date back to the early 1980s, and as of 2008 were strengthened with the publication of new guidelines based on International Public Sector Accounting Standards.⁴ However, while most cantons and municipalities present accounts which follow common principles, differences across cantons remain. Hence, municipal budget data had to be carefully checked to ensure consistent classification of public finance data, especially for municipal revenues from transfer payments, as well as for municipal expenditures for social policies. This check resulted in the exclusion of public finance data from six municipalities located in three cantons (Basel-Stadt [3 municipalities], Schwyz [3 municipalities], and Nidwalden [1 municipality]).

Operationalisation of the dependent variable: social expenditures in metropolitan municipalities

In order to measure policy efforts to address redistributive issues in metropolitan municipalities, we assume these efforts are a function of public expenditures for social policies within these municipalities. In Swiss federalism, all three levels of government are engaged in social policies (Eidgenössische Finanzverwaltung 2012). The national government is responsible for the nationwide social security system (old age, disability, unemployment, health) which is uniform across the entire country. The cantons, too, are important providers of social policies: all cantons taken together account for a share of social expenditures (38.8 percent of overall social expenditures) that is almost equal to that of the national government (41.1 percent). But there is considerable variation across cantons (Eidgenössische

Finanzverwaltung 2012). Relative to expenditures by all the municipal governments within the same canton, the cantonal share in social expenditures in the fourteen cantons under scrutiny here is very high in the cantons of Basel-Stadt (97.7 per cent) and Nidwalden (90.0 per cent), as well as Geneva (86.0 per cent), but very low in the canton of Zurich (42.6 per cent). In the remaining cantons, the cantonal share of social expenditures lies between 60 and 80 percent (Lucerne: 59.4 per cent; Solothurn: 60.0 per cent; Schwyz: 62.8 per cent; Bern: 63.4 per cent; Aargau: 64.1 per cent; Schaffhausen: 64.2 per cent; Vaud: 67.5 per cent; Basel-Land: 70.9 per cent; Fribourg: 76.9 per cent; Ticino: 78.1 per cent).

In spite of the national and cantonal governments' predominance in social policies, municipalities are important, too (see Höpflinger 1994). Overall, they account for 20.1 percent of social expenditures in the country, and can decide rather autonomously about how to allocate this share.⁵ Most significantly, municipalities are autonomous in the field of social welfare, entailing monetary and other benefits to households that live below the poverty line. They also provide a range of services to various socially disadvantaged target groups (such as child day care, social housing, homes for the elderly, integration programs for migrants etc.), and often do this in cooperation with neighbouring municipalities. In addition, municipalities play an important role in the implementation of cantonal social policies. For instance, they administer the payment of benefits related to cantonal social policy schemes, they operate services defined by cantonal legislation and funded by the canton, and they participate in cantonal social policy programmes addressing social problems of a variety of target groups (e.g. long-term unemployed, youth, elderly, asylum seekers, etc.). As we know since Pressmann and Wildavsky's (1973) classic piece, implementation is not simply a neutral application of policy decisions taken by other governments, but a process with some discretion to influence policy substance. In the multi-levelled, intergovernmental framework of social policy making in Switzerland the municipalities thus have a crucial role.

Municipal social expenditures, reported in municipal financial statements, are a good measure for this role. Indeed, according to the accounting guidelines published by the Swiss Public Sector Reporting Advisory Committee (Konferenz der kantonalen Finanzdirektorinnen und Finanzdirektoren 2008), expenditures subsumed under this category cover social policy efforts quite comprehensively. However, not only expenditures decided autonomously by the municipal government are booked into this category, but also those related to the implementation of cantonal social policies.⁶ While the former can be expected to vary across municipalities, this is less likely for the latter, as all municipalities within one canton will be submitted to the same cantonal social policy framework. However, given the differences of social policy between cantons, the part related to cantonal social policy efforts in municipal expenditures is likely to vary across the different cantons. Hence, for the purpose of the multivariate analyses, we use z-score transformation to standardise this value within each of the cantons covered in this study.

Operationalisation of independent variables on social needs

Social needs in a municipality can be defined as a function of the share of groups in the municipal population in need of financial assistance due to the absence of (sufficient) income from occupational activity. A first measure is the municipal unemployment rate, meaning the percentage of the occupationally active population that is currently seeking a job and is registered with the unemployment insurance scheme. As a second measure of social needs within a municipality, we use the percentage of the municipal population entitled to social welfare benefits, i.e. living below the poverty line.

While these first two variables aim at measuring the presence of social hardship, we account for the absence of social hardship in a municipality by using the taxable income of the municipal population. More precisely, we use ‘equivalent taxable income’ as calculated by

the Federal Finance Administration, a number that takes into account differences in taxpayers' household sizes. And in order to avoid outlier effects, we use the municipal median.

Operationalisation of independent public finance variables

The availability of fiscal resources in a municipality was operationalized as own-source municipal revenues, meaning the income generated from local taxes and fees, and measured in Swiss francs per capita of the municipal population. Given municipal tax autonomy in Switzerland, fiscal resources are not only a function of the income of municipal taxpayers, but also vary according to municipal tax effort, operationalized as the municipal tax rate indexed to the cantonal mean.

Municipal revenues from intergovernmental grants were drawn from municipal financial statements, taking into account the differences in municipal accounting standards across cantons (see Table 5 in the online methodological appendix for details). Due to these different accounting standards, only the aggregated volume of overall intergovernmental transfer revenue is comparable across municipalities. Unfortunately, this operationalisation does not allow distinguishing between purpose-specific transfers related to intergovernmental cooperation (vertical and/or horizontal) and block-grant transfers related to revenue-sharing schemes (tax-base sharing or compensations). Nevertheless, it is an accurate measurement for the overall importance of intergovernmental grants in a municipal budget. As we show in the supplementary material, it can be assumed that transfers from revenue-sharing schemes play the most important role for explaining the observed variance of the dependent variable.

Such revenue-sharing schemes were set up by all Swiss cantons in the second half of the 20th century (see Rühli et al. 2013). Their core objectives are to redistribute fiscal resources from rich to poor municipalities, as well as to compensate unequal burdens on municipal budgets due to specific geographic or social conditions. However, the characteristics of revenue-sharing schemes as well as the extent to which they redistribute resources between

municipalities, varies substantially across cantons (see Table 6 in the supplementary material). We can therefore expect that the relationship between fiscal resources and social needs in a given metropolitan municipality varies according to the extent of redistribution built into the revenue-sharing system of the canton to which this municipality belongs. This influence can be controlled for by taking into account the strength of the cantonal revenue-sharing system, i.e. the extent to which fiscal revenues are shared among municipalities within one canton. Drawing on a recent overview of revenue-sharing systems within Swiss cantons, we operationalise this as the percentage of municipal fiscal resources that are redistributed between municipalities within each canton (Rühli et al. 2013: 101 ff.).

Operationalisation of political preferences for redistribution

As we have seen in the theory section, the polycentrist position on metropolitan governance but also fiscal federalist theory emphasise the responsiveness of municipal governments to its residents' preferences. To measure popular preferences for redistribution at the municipal level, we use the share of votes for left parties in the national elections held in 2011, meaning the cumulated percentage of votes for the Social Democrats, the Greens, the Christian Socialist Party, the Worker's Party, as well as SolidaritéS. As post-election surveys show, voters for these parties strongly support income redistribution and social investment, and can thus be considered to favour expansive social policies (Fossati and Häusermann 2014). In order to take differences across cantons into account, the shares of votes for left-parties were centred to the cantonal mean.

Method

Aside from descriptive and bivariate statistics, our analysis uses multi-level regression analysis. Given the hierarchical structure of the data (metropolitan municipalities are nested within cantons), two-level models were fitted (municipalities at level 1, and cantons at level 2) with random intercepts at the level of the cantons. To limit estimation problems due to the

relatively small number of level-2 units, we used restricted maximum-likelihood estimation as recommended by Steenbergen and Jones (2002). Analyses were undertaken using R.

Findings

Findings will be presented in three steps. In a first step, we explore the territorial distributions of our variables of interest in the seven metropolitan areas. In a second step, we focus on different types of metropolitan municipalities in order to develop a closer understanding of the geographies of social needs, fiscal resources, political preferences, and social expenditures in Swiss metropolitan municipalities. In a third step, we use multivariate analysis to single out the determinants of redistributive policies in metropolitan municipalities.

Social needs, fiscal resources, political preferences, and social policy effort in metropolitan areas

Population-weighted Gini coefficients were calculated to characterise the distribution of each variable in the seven metropolitan areas. The theoretical values of these Gini coefficients range from 0 to 1. The closer to 0, the more the distribution of a given variable corresponds to equality, meaning that all municipalities in a metropolitan area have equal shares of this variable. The results show considerable differences in territorial distributions not only between the variables of interest but also across single metropolitan areas (see Table 2).

With respect to social needs, it appears that unemployed persons are more equally distributed across metropolitan municipalities than are social welfare recipients. Mean taxable income is distributed quite unevenly, too, indicating that spatial inequalities in affluence are more pronounced in Swiss metropolitan areas than spatial inequalities in social hardship. These figures suggest social segregation exists across metropolitan municipalities, and it is especially pronounced in the metropolitan areas of Lausanne, Zurich, Basel and Geneva.

Owing to segregation, there is also an uneven distribution of fiscal resources across metropolitan municipalities, especially in the metropolitan areas of Zurich and Lausanne. The high Gini coefficients of municipal tax efforts point to the uneven distribution of tax rates between wealthier and poorer municipalities in all metropolitan areas. But municipalities are also distinct in terms of revenues they receive from transfer payments, which underscores the importance of inter-municipal fiscal equalisation schemes in Swiss metropolitan areas, especially in the metropolitan area of Geneva. Metropolitan municipalities are also distinct in terms of their citizenry's political preferences for social policies, with polarization particularly deep in the metropolitan areas of Lausanne and Geneva. Finally, territorial inequalities also exist with respect to social policy efforts undertaken by metropolitan municipalities, and they are particularly pronounced in the metropolitan areas of Zurich, Lugano, and Basel.

Table 2: Territorial distribution of social needs, fiscal resources, political preferences, and social expenditures across metropolitan municipalities, population weighted Gini coefficients (data for 2010)

	Lucerne	Zurich	Bern	Geneva	Basel	Lausanne	Lugano
Unemployment	0.176	0.145	0.184	0.151	0.141	0.197	0.157
Social welfare recipients	0.177	0.306	0.200	0.261	0.293	0.358	0.236
Income equivalent	0.622	0.649	0.707	0.783	0.703	0.777	0.624
Municipal revenues from own sources	0.139	0.353	0.167	0.211	0.113	0.271	0.209
Municipal tax effort	0.607	0.648	0.731	0.732	0.613	0.771	0.644
Municipal revenues from transfers	0.546	0.410	0.370	0.314	0.367	0.258	0.251
Votes for left parties	0.464	0.616	0.648	0.709	0.689	0.743	0.648
Overall social expenditures in municipalities	0.132	0.314	0.226	0.324	0.226	0.170	0.302

Interestingly, and contrary to one of the core assumptions of the SSGI thesis, the territorial distributions of social needs, fiscal resources, political preferences, and social policy efforts in these metropolitan areas are unrelated to the degree of institutional fragmentation.

Metropolitan areas in Table 2 are ordered according to the fragmentation of their government structures, Lucerne being the least fragmented, Lugano the most. However, Gini coefficients are not systematically higher to the right of the table.

The Gini coefficients in Table 2 allow a first exploration of existing territorial inequalities in Swiss metropolitan areas. As such, however, territorial inequalities of social needs, fiscal resources, political preferences, and social policy efforts are not necessarily a good measure of spatial inequities. Equity is not a question of equal distribution but rather a question of equal matching of resources to needs. Hence, we need to take a closer look at the places with higher needs and see whether this goes along with the allocation of more resources.

The geography of social needs and fiscal resources in the Swiss metropolis

Existing studies show that residential segregation across municipalities in Swiss metropolitan areas has increased towards the end of the 20th century, not only with respect to social status (mainly income), but increasingly with respect to lifestyle choices (Huissoud et al. 1999, Hermann et al. 2005). Patterns of residential segregation in Swiss metropolitan areas do not simply set off the core cities from the suburbs, but social disparities also exist across the suburbs. These patterns are captured by the typology of Swiss municipalities used by the Swiss Statistical Office, one that distinguishes between four types of municipalities in Swiss metropolitan areas: core cities, inner suburbs located close to the core cities, affluent suburbs characterized by beautiful settings and expensive housing, as well as periurban suburbs located at the outskirts of the metropolitan areas.⁷

Table 3 shows that these four types of municipalities are distinct not only with respect to their size and location, but they also differ significantly in terms of social needs, fiscal resources, political preferences, and social policy effort.⁸ In terms of social needs, core cities and inner suburbs appear to have higher needs compared to affluent and periurban suburbs. Indeed, both unemployment and social welfare rates are higher in core cities than in the suburban municipalities. Median income levels show that affluent suburbs are populated by very wealthy residents, while core cities, on average, are home to poorer households.

Table 3: Social needs, fiscal resources, political preferences, and social policy effort in municipalities of the seven major Swiss metropolitan areas, by type of municipality

		Core cities	Inner suburbs	Affluent suburbs	Periurban suburbs	Overall
Unemployment (percent seeking job)	Mean	3.3	2.6	2.0	1.8	2.1
	S.D.	1.1	0.8	0.6	1.0	1.0
Social welfare (percent with benefits)	Mean	5.2	2.9	1.0	1.3	1.7
	S.D.	2.4	1.6	0.9	1.1	1.5
Median income equivalent (in 1000 CHF)	Mean	34.32	36.855	50.266	37.364	38.633
	S.D.	2.047	4.146	8.040	5.693	6.978
Municipal revenues from own sources (in 1000 CHF per capita)	Mean	9.713	4.515	6.536	4.065	4.510
	S.D.	4.603	1.751	3.138	2.409	2.541
Municipal tax effort (tax rate index)	Mean	97.8	95.3	83.2	98.9	96.2
	S.D.	13.9	11.4	15.5	11.7	13.0
Municipal revenues from transfers (in per cent of overall revenues)	Mean	11.4	12.6	5.3	15.7	13.7
	S.D.	8.7	8.3	4.5	11.8	10.8
Vote for left parties (in percent, centred to cantonal mean)	Mean	18.7	3.7	-3.0	0.3	0.9
	S.D.	10.5	5.7	5.8	6.8	6.9
Social expenditures in municipality (in 1000 CHF per capita)	Mean	1.972	1.148	1.262	0.800	0.954
	S.D.	1.037	0.623	1.031	0.597	0.701
Population	Mean	158,624	8,781	4,487	1,440	5,436
	S.D.	104,608	7,206	4,450	1,445	19,883
Observations		7	164	70	389	630

The four types of municipalities are also distinct in terms of fiscal resources. Municipal revenues from own sources are higher in the core cities and the affluent suburbs - albeit for different reasons. Core cities generate higher revenues from business tax because of higher concentration of businesses in central metropolitan locations. Core cities also extract more taxes from their residents, as is shown by the higher tax effort. Affluent suburbs, in contrast, generate high revenues at a low tax effort, mainly thanks to the presence of very wealthy taxpayers. As a corollary, they also receive less revenue-sharing payments, as is shown by the smaller share of transfer revenues in their municipal budgets.

The average share of votes for left parties in the 2011 national elections shows quite distinct political preferences across the four types of municipalities. Voters of the core cities have the strongest preferences for expansive social policies, those in affluent suburbs the least.

Finally, the four types of municipalities differ with respect to social expenditures - our dependent variable. Core cities have significantly higher per capita social expenditures than suburbs. Among the different types of suburbs, inner suburbs have the highest per capita social expenditures, periurban suburbs the least, with affluent suburbs in between.

The bivariate analysis allows a first tentative answer to the equity question, i.e. whether fiscal resources are adequately matched with social needs in metropolitan municipalities. Findings for the core cities suggest a positive relationship between fiscal resources and social needs there. Social needs in core cities are high, but so are own-source municipal revenues which are topped up by transfer payments. With political preferences clearly leaning towards expansive social policies, the result is a rather high level of social expenditures in these places. On the other hand, findings for the suburban municipalities indicate a mismatch between fiscal resources and social needs. In the suburban zone of Swiss metropolitan areas, social expenditures are astonishingly high in affluent suburbs, although indicators for social needs show low values. Transfer payments are an important revenue source for less well-off municipalities, but do not suffice to compensate for the lack of own-source revenues, resulting in higher tax efforts.

Determinants of social expenditures in metropolitan municipalities in Switzerland

Beyond the bivariate results, multivariate regression analysis allows a more fine-grained understanding of the relationship between social needs, fiscal resources, political preferences, and social expenditures in Swiss metropolitan municipalities. Four different models were estimated (see Table 4).⁹ The first three models estimate the effects of variables measuring social needs, fiscal resources, and political preferences separately. The fourth model includes all the independent variables. In order to avoid multicollinearity, some confounded independent variables had to be omitted from the analysis.¹⁰

Table 4: Predictors of per capita social expenditure (z-scored per canton) in metropolitan municipalities (mixed-effects linear regressions)

Independent variables	Model 1 Social needs	Model 2 Fiscal resources	Model 3 Political preferences.	Model 4 Full
<i>Fixed part</i>				
<i>Variables at level 1 (municip.)</i>				
Unemployment (per cent seeking job)	0.173 ^{***} (0.045)			0.088 [*] (0.042)
Social welfare (per cent with welfare benefits)	0.170 ^{***} (0.030)			0.208 ^{***} (0.028)
Own-source municipal revenues (per capita, in 1000 CHF)		0.218 ^{***} (0.017)		0.211 ^{***} (0.016)
Transfer revenues (per cent of overall municipal revenue)		0.042 ^{***} (0.011)		0.044 ^{***} (0.011)
Votes for left parties in 2011 (mean-centred per canton)			0.012 [*] (0.006)	-0.006 (0.005)
<i>Variables at level 2 (canton)</i>				
Strength of cantonal redistribution regime		1.320 [*] (0.564)		1.317 [*] (0.573)
Constant	-0.516 ^{***} (0.096)	-1.227 ^{***} (0.155)	0.103 [*] (0.051)	-1.685 ^{***} (0.164)
<i>Cross-level interaction</i>				
Transfer revenues * strength of cantonal redistrib. regime		-0.143 ^{***} (0.039)		-0.160 ^{***} (0.038)
<i>Random part</i>				
Variance cantonal level	1.24*10 ⁻⁷	0.004	0.005	0.008
Variance municipal level	1.015	0.795	1.120	0.691
Number of cantons	11	10	11	10
Number of municipalities	611	612	616	606
Deviance Test	71.505 ^{***}	216.24 ^{***}	3.954 [*]	304.28 ^{***}
Intra-class correlation	1.22*10 ⁻⁷	0.00499	0.00486	0.0109

Note: Table entries are restricted maximum-likelihood estimates, with estimated standard errors in parentheses.

Significance tests of random parts based on profile likelihood

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Regarding the influence of social needs, the results of the first model show that social needs do play a significant role in explaining social policy effort in Swiss metropolitan municipalities. Indeed, overall social expenditures in metropolitan municipalities are positively associated with rates of unemployment and social welfare recipients.

The second model estimates the influence of fiscal variables on the dependent variable. Note that there is a logical link between the strength of the cantonal redistribution regime and the share of transfer revenues in the municipal budget: the more redistributive a cantonal revenue-sharing regime, the higher the share of transfer revenues in municipal budgets. A cross-level

interaction term was used to take this effect into account. Results of the second model show that the availability of fiscal resources determines the level of social expenditures in metropolitan municipalities to a large extent. Not only own-source revenues, but also revenues from transfer payments have a positive effect - indicating that revenue - sharing has an effect (see also the additional analysis on this point in the supplementary material). Finally, the strength of the cantonal revenue-sharing regime is a significant predictor: municipalities have higher social expenditures when they are located in cantons whose revenue-sharing regime is strongly redistributive.

The third model estimates the effect of political preferences at the municipal level on social expenditures. It shows that social expenditures in metropolitan municipalities are, as expected, positively associated with the vote for left parties by the municipal electorate.

Finally, the full model shows that the effects identified in the models 1 and 2 - but not model 3 - are quite robust. The level of social expenditures in a metropolitan municipality is not only influenced by social hardship (the presence of needs), but also by the availability of fiscal resources (the availability of own source revenues). Intergovernmental grants also play an important role, as is shown not only by the positive effect of the share of transfer payments in the municipal budget, but also by the positive effect of strong cantonal revenue-sharing regimes. However, the influence of the left party vote is explained away by the other variables. The level of social expenditures in a metropolitan municipality is thus not associated with political preferences of the municipal electorate.

Overall, it appears that social policy efforts are related to social needs in Swiss metropolitan areas to some extent, but this crucially depends on the ability of a municipality to actually generate the revenues necessary to afford social policies - be that because it can extract resources from a good tax base or because it benefits from transfer payments from other

jurisdictions. Political preferences for expansive social policies are only weakly associated with social policy efforts in metropolitan municipalities. These findings indicate that in Swiss metropolitan areas, certain amounts of public resources are indeed allocated to places with social needs, but that these needs are covered in a more comprehensive way when a municipality is affluent. This finding points to serious limitations of the revenue-sharing regimes in terms of ensuring spatial equity. In spite of substantial intergovernmental transfers, own-source revenues remain significant predictors of social policy efforts in Swiss metropolitan municipalities. Spatial equity would entail this relationship to be reversed.

Discussion and conclusion

The aim of this article was to deepen our understanding of the distributional consequences of metropolitan institutional arrangements, by paying a particular attention to the intergovernmental nexus that has been neglected in much of the existing literature. Drawing on empirical data from 630 municipalities in the institutionally fragmented and decentralised setting of seven major Swiss metropolitan areas, we tested contrasting hypotheses derived from two distinct theoretical models of metropolitan governance. From the perspective of the consolidationist, neoprogressive reform model, we expected to find a systematic mismatch between social needs and fiscal resources in metropolitan municipalities, with intergovernmental grants largely insignificant in helping to overcome or compensate this mismatch. From the polycentrist perspective advocated by public choice theorists and fiscal federalists, we expected to find redistributive expenditures in metropolitan municipalities to be positively related to social needs and responsive to local preferences, thanks to intergovernmental grants that ensure supply of fiscal resources.

Neither of these theoretical models is fully supported. Rather, our findings suggest that both models need qualifications. With respect to the consolidationist perspective, our findings provide evidence that buttress some of the core assumptions of the SSGI thesis. In the

fragmented and decentralised institutional setting of Swiss metropolitan areas, social segregation - especially of high-income households - across metropolitan municipalities has resulted in unequal levels of fiscal revenues. Simultaneously, own-source fiscal revenues are important predictors of redistributive efforts in metropolitan municipalities, independent of existing social needs in that municipality. The empirical situation in Swiss metropolitan areas therefore reflects the image drawn by proponents of the SSGI thesis, according to which institutional fragmentation and decentralised governance contributes to spatial inequity, in that it 'enables the rich to lock up their money and resources in the wealthy suburbs, leaving the rest to manage as best they can with their smaller tax bases and greater demands on public services' (Newton 2012: 415). But a closer look at the Swiss case makes clear that some other assumptions by SSGI proponents are overstated. Most significantly, our analysis shows the importance of intergovernmental grants related to policy-oriented cooperation or revenue-sharing. Transfer payments are an additional source of revenue for metropolitan municipalities and crucial to redistributive policy efforts. Even if, at the end of the day, suburbs with wealthy taxpayers can afford to spend more on social policies and often chose to do so, strong cantonal revenue-sharing regimes do have a moderating effect on spatial inequities. Intergovernmental grants contribute to compensating the mismatch between resources and needs across metropolitan municipalities - especially when they are linked to strong cantonal revenue-sharing schemes.

But our findings are also in line with some of the core assumptions made by advocates of the polycentric model. Social expenditures in metropolitan municipalities are related to existing social needs: places with more social needs also have higher levels of social expenditures. And the nexus of intergovernmental cooperation and interventions from higher levels of government ensures that fiscal resources are redistributed so that places with less own-source revenues receive some supplementary means to engage in social policy efforts. Contrary to

the expectations formulated by both polycentrists and fiscal federalists, however, we did not find strong evidence for social policy efforts in metropolitan municipalities being conditioned by local electorates' political preferences. A clear correlation between left voting and high social expenditures was only found for the core cities - but was not confirmed for suburban municipalities in which the bulk of the metropolitan population lives. This finding is theoretically significant as it goes against the decentralisation theorem. Indeed, fiscal federalists argue that decentralisation is per se preferable to centralisation because local autonomy automatically ensures better accountability, meaning a sensitivity of outcomes to preferences (Oates 2005). The governance arrangements in the metropolitan areas under scrutiny in this study correspond quite neatly to the precepts of decentralised governance - but we find no evidence for policy responsiveness in metropolitan municipalities.

Of course, this study also has limitations. Beyond the problems related to collecting sufficiently fine-grained data on the public finance variables of interest, the availability of data for one single year only makes it impossible to disentangle the endogeneity issues that come along with analysing social policies at the local level. Further research should thus focus not only on collecting better public finance data, but also data for several time points, to test the robustness of our findings on the basis of longitudinal analyses. Another weakness of this study is that it does not address spatial auto-correlation of data on local expenditures owing to interjurisdictional competition (see Minkoff 2009). This was mainly due to the methodological complexities involved by the specification of spatial lag models with data on municipalities located in different cantons - a point that could also be addressed in further research.

These limitations notwithstanding, the findings of this study underscore the role of the intergovernmental nexus in shaping spatial equity in metropolitan areas. This topic was raised by new regionalists a while ago, conjecturing on the possibility that intergovernmental

cooperation and tax-base sharing in fragmented metropolitan settings could help address issues of redistribution. Their conjecture was received with widespread scepticism, notably by defendants of the consolidationist position (Howell-Moroney 2008), but remained understudied to date. Indeed, revenue-sharing systems are extremely rare in the US, and the possibilities to empirically assess their effects are limited. Our study on Swiss metropolitan areas, where such arrangements are common, can therefore contribute to this debate. More precisely, our findings suggest that intergovernmental cooperation and revenue-sharing have an effect on local social policy efforts and therefore do contribute to matching resources to needs in metropolitan areas. The institutional setting of Swiss metropolitan areas bears many resemblances to the polycentrist ideal. But this multi-level compound of fragmented institutions and decentralised governance has obviously offered opportunities for redistributive efforts by local governments: our study has found tieboutanism tamed by intergovernmental cooperation and revenue-sharing that result in some - even though not full - compensation of spatial inequities.

The implication for the debate on metropolitan governance in the US is that the issue of spatial equity should be no longer discussed solely in terms of institutional consolidation versus fragmentation. Our study shows that, to understand the redistributive effects of metropolitan governance arrangements, a more nuanced perspective is warranted - one that takes into account the workings of metropolitan governance a multi-levelled, compound system of governance that function as 'place equality regimes', as Sellers et al. (2017) have argued. Place equality regimes are rooted in long-term institutional and political developments, and vary across countries and even across metropolitan areas within countries. They are the combination of effects from welfare state institutions, central-local relations, as well as intergovernmental cooperation and revenue-sharing at the sub-national levels. As mechanisms that organise fiscal solidarity among jurisdictions that provide services to

citizens, they determine who gets what, when and where, and thereby structure social inequalities more widely.

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Supplementary Material (for online publication)

Methodological Appendix

The analyses presented in this article draw on municipal level data about the socio-demographic composition, spatial context, and public finances, in 2010, in seven metropolitan areas in Switzerland with a population of over or near 200,000 inhabitants. Data was collected from three official sources. Population census data on the territorial extension and the institutional structure of metropolitan areas, municipal-level aggregates of socio-demographics, geographical characteristics, as well as data on election results were drawn from the website of the Swiss Statistical Office (www.bfs.admin.ch). The core figures on Swiss public finance at the national and cantonal levels stem from publications by the Federal Finance Administration, the State Secretariat for Economic Affairs, the Federal Tax Administration, and from a secondary analysis of cantonal systems of revenue-sharing (Rühli et al. 2013). The Federal Tax Administration's website (www.estv.ch) also provided municipal level aggregates of data on residents' taxable income, on income distribution within municipalities, as well as on the overall revenues from national income tax. Public finance data on the 630 municipalities was collected from statistical offices and financial oversight authorities of the cantons to which these municipalities belong, as well as directly from the municipalities when data was not available from oversight authorities. We would like to thank contact persons within these organisations for their help. Moreover, financial data for the municipalities located in the cantons of Basel-Stadt (n=3), Schwyz (n=3), and Nidwalden (n=1) was excluded because of specific accounting rules that make them incomparable. These 7 municipalities (and their cantons) are treated as missing in the multi-variate analysis. For the two municipalities in the canton of Schaffhausen, no public finance data on the independent variables could be obtained. They are additionally treated as missing in models 2 and 4.

The following table presents the operationalization of the variables used throughout the analysis.

Table 5: Description and operationalization of variables used

Variable name	Definition	Missing values
Municipal-level variables (all 2010 unless otherwise noted)		
Population	Municipal population on 31 December 2010	0/630
Unemployment (%)	Registered unemployed / Total population between 18 and 65 *100	11/630
Social welfare rate (%)	Persons receiving social welfare benefits / population size	0/630
Type of municipality	Typology of municipalities, 4 types	0/630
Vote for left parties (2011)	Cumulative percentage of votes for the Social Democratic Party, Green Party, Christian Socialist Party, Workers' Party, and Solidarités, 2011 national election	1/630
Equivalent income median	Disposable household income weighted by household size, municipal median	1/630
Local public finance data of metropolitan municipalities		
Total municipal revenue	Total municipal revenue	14/630
Social expenditures in municipality	Expenditures of the official functional category "social welfare" in municipal financial statements (per capita of municipal population for bivariate analyses; z-scored within cantons for multivariate analyses)	14/630
Share of transfer revenues	Revenues from transfer payments relative to total municipal revenue Transfer payments operationalized as: <ul style="list-style-type: none"> • LU: account 'general contributions' (#44) • BL, SO: account 'contributions' (#46) • AG, FR, VD: sum of accounts 'refunds from other jurisdictions' (#45) and 'contributions' (#46); • BE, ZH, TI: sum of accounts 'general contributions' (#44), 'refunds from other jurisdictions' (#45), 'contributions' (#46); • GE: sum of accounts 'refunds from other jurisdictions' (#45), 'contributions' (#46), 'equalization fund' (#408) • BS, NW, SH, SZ: data unavailable 	12/637
Municipal revenues from own sources	Total revenue - revenue from transfer payments	18/630
Tax rate index	index: $100 \cdot (t_j / \text{mean}(t_j))$, where: t: tax rate i: commune subscript j: canton subscript	9/630
MA-level variables		
Gini coefficient	$G = \left 1 - \sum_{k=1}^{n-1} (X_{k+1} - X_k)(Y_{k+1} + Y_k) \right $ where: G: Gini coefficient X: cumulative percentage of population Y: cumulative percentage of [unemployed persons, persons with social welfare benefits, equivalent income, federal tax revenues]	0/7
Governmental fragmentation)	number of municipalities per 10,000 inhabitants	0/7
Cantonal level variables		
Strength of cantonal redistribution regime	Share of absolute redistribution relative to aggregated municipal tax revenues	0/14

Sources:

- mean income federal income tax, Gini coefficients on municipal (taxable income 2010), mean and median income equivalent: Swiss Federal Tax Administration
- local public finance data: statistical offices and finance administrations of cantons and municipalities
- Unemployed 2010: State Secretariat for Economic Affairs
- Financial statistics 2010: Federal Finance Administration
- Percentage of inter-municipal redistribution according to Rühli, Frey, and Frey 2013.
- all other data: Swiss Federal Statistical Office

Revenue-sharing systems in Swiss cantons : background information

Sub-national revenue-sharing systems are an important feature of intergovernmental relations in Swiss federalism. Indeed, all the municipalities covered in this study are located in cantons where such revenue-sharing systems have been set up through cantonal legislation over the 20th century. All these systems are compulsory for municipalities, and they contain at least one core mechanism - equalization of fiscal resources - by which fiscal revenues are re-distributed between rich and poor municipalities via a pool managed by the canton. Beyond this common core, however, there is an impressive variety of additional revenue-sharing mechanisms across cantons, which often also involve a vertical sharing of cantonal revenues with municipalities (Table 6). Most cantons have introduced mechanisms that aim at compensating extra burdens on municipal budgets due to geography (e.g. peripheral location, topography) and/or socio-demographic conditions (e.g. high proportions of elderly persons). Furthermore, revenue-sharing systems in some cantons have introduced additional compensations for cities that provide services to their wider metropolitan area (so-called central services). Finally, there is a range of additional specific features, such as the so-called ‘indirect equalization mechanism’ in the cantons of Vaud and Ticino (by which some cantonal subsidies to municipalities are means-tested according to municipal financial capacity), as well as the ‘commuter tax’ in Geneva (featuring a sharing of income tax revenues between taxpayers’ places of residence and work).

Table 6: Mechanisms of revenue sharing in Swiss cantons: comparative overview (state in 2010)

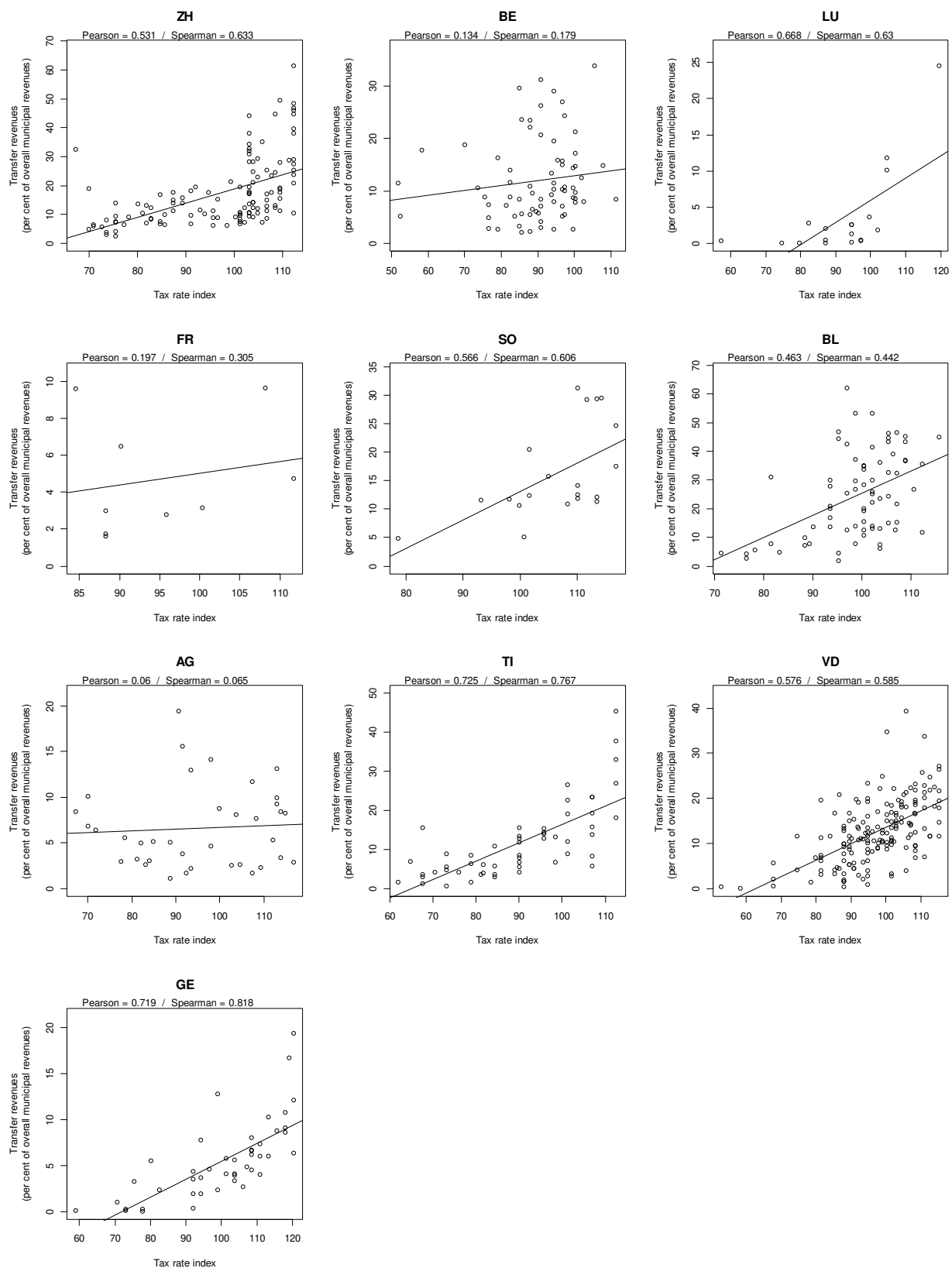
Canton	Equalization of fiscal resources	Compensation of extra burdens	Central city compensations	Specific mechanisms	Strength of redistribution*
Aargau (AG)	Yes	Yes	No		5.6
Baselland (BL)	Yes	Yes	No		23.5
Bern (BE)	Yes	Yes	Yes		23.5
Fribourg (FR)	Yes	Yes	No		7.9
Geneva (GE)	yes	yes	Yes	Commuter tax	21.9
Lucerne (LU)	Yes	Yes	No		14.7
Nidwalden (NW)	Yes	Yes	No		28.7
Schaffhausen (SH)	Yes	Yes	No		2.6
Schwyz (SZ)	Yes	yes	No		17.5
Solothurn (SO)	Yes	No	No		14.9
Ticino (TI)	Yes	Yes	No	Indirect equal.	21.8
Vaud (VD)	Yes	No	No	Indirect equal.	48.4
Zurich (ZH)	yes	Yes	Yes		30.0

Sources: AG: Gesetz über den Finanz- und Lastenausgleich (615.100); BL: Finanzausgleichsgesetz (185); BE: Gesetz über den Finanz- und Lastenausgleich (FILAG), FR: Gesetz über den interkommunalen Finanzausgleich (142.1); GE: Loi sur le renforcement de la péréquation financière intercommunale et le développement de l'intercommunalité (B 6 08), Loi sur les contributions publiques (D 3 05); LU: Gesetz über den Finanzausgleich (610); NW: Gesetz über den direkten Finanzausgleich (512.1); SH: Gesetz über den Finanzausgleich, SZ: Gesetz über den Finanzausgleich (154.100), SO: Gesetz über den direkten Finanzausgleich (131.71); TI: Legge sulla perequazione finanziaria intercomunale (2.1.2.3); VD: Loi sur les péréquations intercommunales (175.51); ZH: Finanzausgleichsgesetz (132.1)

* Rühli et al. (2013: 101 ff.): percentage of municipal fiscal revenues that are redistributed between municipalities within each canton.

But cantonal revenue-sharing systems also differ in the extent to which they equalise revenues between municipalities (Table 6): the percentage of fiscal resources that are redistributed between municipalities within each canton ranges from a very low 2.6 percent in the canton of Schaffhausen, to a high maximum of 48.4 percent in Vaud. In general, however, revenue-sharing schemes in all cantons can be seen to contribute to higher transfer-payments for fiscally weaker municipalities. This is shown in Figure 1: the higher municipal tax rates (an indicator for fiscal stress), the higher the share of transfer revenues in overall municipal revenues.

Figure 1: Bivariate relationship between municipal tax rate and share of transfer revenues in overall municipal revenues across cantons*



*four cantons omitted due to low case numbers: BL (n=3), SZ (n=3), SH (n=1), NW (n=1)

The separate effect of earmarked grants and general grants: additional analysis on the municipalities of the canton of Lucerne

One of the independent variables of interest in this analysis is municipalities' transfer revenues. For Swiss municipalities, the two most important sources of transfer revenues are transfer payments related to policy-cooperation with other governments ('contributions and refunds'), or transfer payments related to revenue-sharing systems ('equalization payments'). For instance, a municipality will receive a 'contribution' from the canton to cover the expenditures of health-insurance benefits for needy citizens defined by cantonal legislation, and it will receive 'refunds' by neighboring municipalities for a service it offers to drug users as part of an inter-municipal cooperation agreement. 'Equalization payments' are transfers that stem from revenue-sharing schemes to which the municipality is entitled as a consequence of its poor financial situation and/or extra charges.

Ideally, the effects of these two types of transfer revenues on the dependent variable should be estimated separately. Indeed, transfer income from revenue-sharing schemes is not earmarked and municipalities are free to decide how to use such income. This is not always the case for transfer revenues from refunds and contributions most of which is earmarked and its use is thus constrained by cantonal legislation or inter-municipal agreements. Unfortunately, in the large majority of municipalities in our sample, financial statements do not systematically distinguish transfer revenues according to these two sources. We therefore can only analyse the effect of transfer revenues globally, as a more fine-grained distinction is impossible with the data at hand.

Luckily, however, there is an exception: the canton of Lucerne whose standards of municipal accounting allow a distinction between these two sources of transfer revenues. In order to disentangle their individual effects, we re-ran the four regression models estimated in the

main text on the municipalities in the canton of Lucerne (Table 4). In order to increase statistical power, this analysis is not limited to the municipalities within the Lucerne metropolitan area, but includes all municipalities located in the canton of Lucerne. Given that these municipalities are all located within the same canton, linear regression was used.

Table 7: Predictors of logged per capita social expenditure of municipalities in the canton of Lucerne (linear regressions)

Independent variables	Model 1 Social needs	Model 2 Fiscal resources	Model 3 Political preferences.	Model 4 Full
<i>Variables at level 1 (municip.)</i>				
Unemployment (per cent seeking job)	-0.048 (0.058)			0.033 (0.062)
Social welfare (per cent with welfare benefits)	0.167*** (0.039)			0.132** (0.039)
Own-source municipal revenues (per capita, in 1000 CHF)		0.136*** (0.030)		0.120*** (0.029)
Transfer revenues 1 (per cent of overall municipal revenue)		0.009** (0.002)		0.009** (0.003)
Transfer revenues 2 (per cent of overall municipal revenue)		0.000 (0.007)		-0.000 (0.006)
Votes for left parties in percent (2011 national elections)			0.005 (0.005)	-0.000 (0.006)
Constant	6.649*** (0.068)	6.070** (0.203)	6.735*** (0.070)	6.010*** (0.211)
Number of municipalities	84	83	85	80
Adjusted r-square	0.168	0.180	0.002	0.294

Notes: Table entries are unstandardized OLS coefficients, with estimated standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The dependent variable was logged to increase model fit.

Transfer revenues 1 stem from revenue-sharing and fiscal compensation schemes.

Transfer revenues 2 stem from policy-related cooperation schemes.

In terms of significant predictors, the analysis of the Lucerne municipalities yields exactly the same results as the analysis of the full sample of metropolitan municipalities presented in the main text. Per capita social expenditures in the municipalities of the canton of Lucerne are also associated with social needs (i.e. percent on welfare), with own-source revenues, as well as with the share of transfers in overall municipal revenues. Regarding the latter, models 2 and 4 in Table 4 clearly show that among the two sources of transfer revenues, it is those

stemming from revenue-sharing systems that make the difference. Transfer payments stemming from policy-related intergovernmental cooperation are not significantly associated with per capita social expenditures in a municipality. In the canton of Lucerne, it clearly appears that revenue-sharing systems contribute to the variance of social expenditures between municipalities, and thus make a contribution to matching resources to needs across fragmented local government systems.

Endnotes

- ¹ The official nomenclature of the Swiss Statistical Office uses the term ‘agglomerations’ (in German: Agglomerationen; in French: agglomérations; in Italian: agglomerati). Commuter patterns are the core criterion used for their operational measurement (Bundesamt für Statistik 2014). Conceptually, the Swiss agglomerations are thus equivalent to the US notion of Metropolitan Statistical Areas. Throughout this text, we use the term ‘metropolitan areas’ as a synonym of agglomerations.
- ² The metropolitan areas of Basel, Geneva and Lugano are close to or at international borders, and thus extend into neighbouring Germany, France or Italy. For the purpose of the analysis presented in this paper, we exclude the international parts of these three metropolitan areas.
- ³ Indeed, since the implementation of a major reform decided in 2004 (the so-called *Neuer Finanz und Lastenausgleich*), the workings of Swiss federalism have been strongly inspired by the theoretical model of fiscal federalism. Besides a redistribution of different tasks between state levels, new systems of intergovernmental cooperation and revenue-sharing were devised at the federal level. This federal reform has also sparked reforms of intergovernmental relations within cantons (Frey and Frey 2013).
- ⁴ As published by the International Federation of Accountants, the global organization for the accountancy profession (see www.ifac.org, accessed on 21st of August 2015)..
- ⁵ Note that municipal autonomy in social policy matters varies across cantons - as is also reflected in the varying shares of cantonal social expenditures relative to municipal social expenditures quoted above.
- ⁶ The category ‘social expenditures’ is divided into nine sub-categories, and these are further divided into 30 sub-sub-categories (Konferenz der kantonalen Finanzdirektorinnen und Finanzdirektoren 2008: appendix B). Even the sub-sub-categories contain expenditures decided by the municipal government as well as those related to cantonal social policies. It was therefore impossible to disentangle expenditures decided by different government levels in this data.
- ⁷ The original terms for these types of municipalities were *centres* (core city), *communes suburbaines* (inner suburbs), *communes riches* (affluent suburbs), and *communes périurbaines* (periurban suburbs) (Schuler et al. 2005).

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- ⁸ Bivariate analysis of variance with Scheffé's post-hoc test was used to assess the significance of differences across municipal types. Statistically significant differences are reported at $p < 0.05$.
- ⁹ The dependent variable was logged in order to improve model fit.
- ¹⁰ More precisely, median resident income was omitted because it is strongly correlated with municipal own-source fiscal revenues ($r=0.341^{***}$), and the municipal tax rate was omitted because it is strongly correlated with share of transfer revenues ($r=0.424^{***}$), see also Figure 1 in the Supplementary Material).